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Remarks

Reconsideration of the above referenced application in view of the enclosed amendment and remarks is requested. No Claims are amended. Claims 9-10, 19-20 and 29-30 are canceled. Claims 1-3, 6-7, 11-13, 16-17, 21-23, 26-27, 32 and 34-36 remain in the application.

ARGUMENT

Claims 1, 6, 7, 11, 16, 17, 21, 26, 27, 32, 34 and 35 are rejected under 35 U.S.C. § 103(a) as being unpatentable over USPN 5,323,247 to Parker et al. (hereinafter, "Parker et al.") in view of JP 403259193 to Sato et al. (hereinafter, "Sato et al.") and further in view of USPN 5,850,294 to Apostolopoulos et al. (hereinafter, "Aposto") and further in view of USPN 6,229,578 to Acharya et al. (hereinafter, "Acharya et al."). This rejection is respectfully traversed based on the foregoing and following discussion.

As for Claim 1, the recited method requires:

first, smoothing the image using a sharply peaked filter to produce a smoothed image;

detecting an edge in the smoothed image;

performing lowpass filtering on the smoothed image to produce an enhanced image, wherein lowpass filtering is performed using a high frequency cutoff filter only on non-edge areas of the smoothed image as determined by the edge detection; and

performing median filtering to the enhanced image only on non-edge areas of the enhanced image as determined by the edge detection.

Parker et al. teach a method which (i) smoothes based on an adaptive run-time algorithm (smoothing pass 1); (ii) averaging smoothed image; (iii) implied edge detection; (iv) low pass filtering of the entire image (smoothing 2); (v) optionally applying an impulse remover on non-edge pixels; and (vi) remapping pixels near extremes. As disclosed, Parker et al. do not show the limitations of the recited claim. Since there are several smoothing phases, it is unclear why there is a motivation to apply the filter of Sato specifically to the first smoothing step. This is not taught or suggested by Parker et al. Nor does Sato suggest that a method having several smoothing or filtering steps should apply sharply peaked filtering to the first smoothing step.

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However, even if this modification of Parker et al. were to be obvious, which Applicant does not admit, further applying the teachings of Aposto to Parker et al. do not result in the claimed invention. Parker et al. teach using edge detection at the optional impulse remover stage. The second smoothing step using low pass filtering does not suggest filtering only on non-edge areas. Thus, Parker et al. require an extra step to perform the image filtering. Further, Parker et al. admit that the method "produces gray scale levels near the extremes that are still not accurately reproduced" (Col. 19, lines 46-48). Thus, Parker et al. requires an additional step of remapping pixels near the extremes.

The Examiner asserts that Parker et al. suggest a statistical based smoothing algorithm at the second smoothing step (low pass filtering). However, Parker et al. do not suggest that this filtering should be median filtering. Further, applying statistical filtering at this stage does not produce the same results as Applicant's claimed invention. Thus, applying the median filter of Acharya et al. at the low pass filtering step of smoothing (as allegedly suggested by the mere mention of statistical smoothing) would not result in Applicant's invention, nor will it produce the improved results of Applicant's invention. Moreover, there is no suggestion at the cited reference in Acharya et al. or in Parker et al. that performing median filtering only on non-edge areas is required or even desirable. The only mention of performing filtering on non-edge areas is with regard to the impulse remover in Parker et al. and the only reference to statistical filtering is to a smoothing filter. Thus, combining these references as suggested by the Examiner would be inconsistent to the teachings of the prior art.

Claim 1 requires a temporal execution of the recited steps, as indicated by the use of the term "first" in the first smoothing step using a sharply peaked filter. This temporal execution of the steps is also inherent in this particular art area because smoothing and filtering produce results to be smoothed or filtered in a following step. Performing the steps out of order would produce different and likely unexpected poor results. It will be apparent to one of skill in the art that performing smoothing and filtering in a different order as taught in the prior art would not be likely to produce better results as the order is important to the results. In this case, the order of the steps is important to provide the advantages of Applicant's invention. One important advantage is that the number of operations in the one pass to enhance the image are reduced from

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methods taught in the prior art. Applicant's claimed invention requires only two smoothing operations (one with a sharply peaked filter, and one with lowpass filtering on non-edge areas). Edge detection must, of course, be performed before an operation that uses edge information. After the smoothing, the median filtering is applied only to non-edge areas of the *enhanced image*. The statistical filtering of Parker et al. is not suggested for an enhanced image that has been smoothed as required by Applicant's claim. Therefore, even if Sato, Aposto and Acharya et al. were applied to Parker et al. at the "suggested" steps, it will not result in Applicant's claimed invention. Thus, the Examiner has failed to show *prima facie* evidence that the cited references teach all of the elements and limitations of Claim 1 in the appropriate steps to provide an enhanced image. Claim 1 and its progeny are believed allowable.

As for Claims 7, 11, 16, 17, 21, 32, 34 and their progeny, the arguments discussed above equally apply. For Claims omitting the limitation of applying lowpass filtering *only on non-edge areas* (Claims 7, 17, 27), the step of performing *median filtering only on non-edge areas* is still not shown in the cited references and is not suggested by Parker et al. Thus, and Claims 7, 11, 16, 17, 21, 32, 34, and their progeny are believed allowable.

With regard to Claim 35, one pass of Parker et al. is not the same as one pass of Applicant's claimed invention. As discussed above, Parker et al. requires extra steps of averaging, and does not suggest low pass filtering on only non-edge areas and median filtering of the enhanced image only on non-edge areas. Therefore, Claim 35 is believed allowable.

Claims 2 and 36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over USPN 5,323,247 to Parker et al. (hereinafter, "Parker et al.") in view of JP 403259193 to Sato et al. (hereinafter, "Sato et al.") and further in view of USPN 5,850,294 to Apostolopoulos et al. (hereinafter, "Aposto") and further in view of USPN 6,229,578 to Acharya et al. (hereinafter, "Acharya et al.") and further in view of USPN 5,852,475 to Gupta et al. (hereinafter, "Gupta et al."). This rejection is respectfully traversed based on the foregoing and following discussion.

Claims 2 and 36 are believed allowable as being dependent on an allowable base claim.

Claims 3, 12, 13, 22 and 23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over USPN 5,323,247 to Parker et al. (hereinafter, "Parker et al.") in view of JP 403259193 to Sato et al. (hereinafter, "Sato et al.") and further in view of USPN 5,850,294 to Apostolopoulos

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et al. (hereinafter, "Aposto") and further in view of USPN 6,229,578 to Acharya et al. (hereinafter, "Acharya et al.") and further in view of USPN 5,343,309 to Roetling (hereinafter, "Roetling"). This rejection is respectfully traversed based on the foregoing and following discussion.

Claims 3, 12, 13, 22 and 23 are believed allowable as being dependent on an allowable base claim.

All pending claims are now believed allowable and should be permitted to issue at the earliest possible time.

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CONCLUSION

In view of the foregoing, Claims 1-3, 6-7, 11-13, 16-17, 21-23, 26-27, 32 and 34-36 are all in condition for allowance. If the Examiner has any questions, the Examiner is invited to contact the undersigned at (703) 633-6845. Early issuance of Notice of Allowance is respectfully requested. Please charge any shortage of fees in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-0221 and please credit any excess fees to such account.

Respectfully submitted,

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